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To: **CEC Title 24 Committee**
From: Josh Plaisted – SunEarth Inc
CC:
Re: *Proposed Modification to Title 24 Standards*
Date: Wednesday, November 6, 2001

Description

SunEarth proposes that the manner in which solar hot water systems are handled in multi-family dwellings be changed. The current prescriptive measures rely on performance measurements determined for OG-300 systems certified by the Solar Ratings and Certification Corporation (SRCC). Since OG-300 systems are designed for single-family residential loads of 65 gallons/day, they are quite different in design to central boiler systems that might handle 650 gallons/day in multi-family dwellings. Solar systems designed for central boiler applications are most cost effective using centralized arrays and large ASME code storage vessels that do not fit within the OG-300 guidelines. It is proposed that the solar fractions for central hot water systems for multi-family applications be based on computer simulation programs such as F-chart. Performance maps for the solar collectors would be based on SRCC OG-100 collector ratings. If this methodology were to be accepted then a barrier to the use of solar in multi-family applications could be removed.

Benefits

The benefits of solar hot water systems are significant as they can reduce the hot water energy demands by up to 70%. With hot water constituting a significant part of overall energy requirements, the impact is significant. Extending the ease of incorporating solar from single family to multi-family applications opens up another market segment to possible energy reductions.

Environmental Impact

The environmental impact of a 70% reduction in energy use for hot water demands creates significant reductions in the emission of combustion products such as CO₂, NO_x, and SO_x.

Type of Change

The type of change required would be a simple change in the modeling methodology that would allow a computer simulation to determine the solar fraction of a particular system design instead of the reliance on an OG-300 rating that is used with table 6-8 of the current standards. This solar fraction would be used as the input for line 1-c of the water heating worksheet DHW-1.

Measure Availability & Cost

The measure availability and cost of multi-family solar systems is below that of single-family applications already included in title 24 standards.

Useful Life, Persistence, & Maintenance

Useful life of multi-family solar systems averages 20 years with minimal preventative maintenance.

Performance Verification

Performance verification of these types of systems is accomplished by verifying that the collectors have an OG-100 rating from the SRCC. Additionally, the building inspector can verify that the system is installed along the recommendations of ASHRAE or IAPMO guidelines.

Cost Effectiveness

Payback for multi-family systems is almost always less than single-family systems and will in most cases pay back in under 10 years and quite often less.

Analysis Tools

As previously mentioned, analysis tools such as F-chart are widely available to calculate the solar fraction and are already approved as simulation tools by the CEC. All that this modification requires is that the solar fraction determined by these tools are allowed as an alternative to table 6-8 in multi-family applications with central boilers.

Relationship to Other Measures

This proposed modification has no impact on other measures aside from allowing simulation tools to be used in determining the solar fraction for multi-family applications in the water heating worksheet.